Portland Harbor
Reference 6
Part 3 of 3

Sediment Investigation
Data

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MEMORANDUM

DATE: 9 January 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle RMM

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: T870
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AAAP

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 26 samples, SDG T870, collected from the Willamette River has been completed. The sediment samples were analyzed for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97384072	97384073	97384074	97384076	97384078
97384079	97384080	97384081	97384082	97384083
97384084	97384085	97384086	97384088	97384089
97384090	97384091	97384093	97384094	97384095
97384096	97384097	97384098	97384099	97384100
97384101				

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract.

1. Holding Times

   All samples were analyzed within holding time criteria.

2. Instrument Detection Limits

   Laboratory reporting limits (RL) are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration Verification

   All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

   a. Laboratory Method Blanks

      No analytes were detected in laboratory method blanks.

   b. Field Blanks

      No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

   The recoveries for TOC were within the control limits of 70 - 130 percent.

6. Laboratory Duplicate Sample Analysis

   All relative percent differences (RPD) between analytical results met QC criteria of 35 percent (for concentrations greater than 5 times the quantitation limit).

7. Spiked Sample Analysis

   Matrix spike recoveries met QC criteria of 75 to 125 percent.

8. Field Duplicate Analysis

Samples 97384086 and 97384088 were field duplicates. Results exhibited acceptable agreement.

9. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the CRDL or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters WR-SD-SD026-0000

Sample No: 9738 4072

Lab Sample ID: T870A
LIMS ID: 97-17196
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/17/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	45.4
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/5/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD028-0000

Sample No: 9738 4073

Lab Sample ID: T870B
LIMS ID: 97-17197
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/17/97
Data Release Authorized: MB Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.0
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

MB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD030-0000

Sample No: 9738 4074

Lab Sample ID: T870C
LIMS ID: 97-17198
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/17/97
Data Release Authorized: MB Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.8
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

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JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD- SD035-0000

Sample No: 9738 4076

Lab Sample ID: T870D
LIMS ID: 97-17199
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.8
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD023-0000

Sample No: 9738 4078

Lab Sample ID: T870E
LIMS ID: 97-17200
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: MP Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	40.5
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD022-0000

Sample No: 9738 4079

Lab Sample ID: T870F
LIMS ID: 97-17201
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	45.7
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD033-0000

Sample No: 9738 4080

Lab Sample ID: T870G
LIMS ID: 97-17202
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	42.5
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD032-0000

Sample No: 9738 4081

Lab Sample ID: T870H
LIMS ID: 97-17203
Matrix: Sediment
Data Release Authorized:
Reported: 10/17/97 Dr. M.A. Perkins

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00
Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	37.4
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD031-0000

Sample No: 9738 4082

Lab Sample ID: T870I
LIMS ID: 97-17204
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	44.3
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD016-0000

Sample No: 9738 4083

Lab Sample ID: T870J
LIMS ID: 97-17205
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MB
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.6
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD027-0000

Sample No: 9738 4084

Lab Sample ID: T870K
LIMS ID: 97-17206
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: MB Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	48.1
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD025-0000

Sample No: 9738 4085

Lab Sample ID: T870L
LIMS ID: 97-17207
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	48.2
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD021-600C

Sample No: 9738 4086

Lab Sample ID: T870M
LIMS ID: 97-17208
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	48.1
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 10/15/97

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD021-0000

Sample No: 9738 4088

Lab Sample ID: T870N
LIMS ID: 97-17209
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	47.3
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD029-0000

Sample No: 9738 4089

Lab Sample ID: T8700
LIMS ID: 97-17210
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Date Received: 09/20/97

Data Release Authorized:
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	46.9
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD- SD002-0000

Sample No: 9738 4090

Lab Sample ID: T870P
LIMS ID: 97-17211
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized:
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	70.9
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	0.86

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD004-0000

Sample No: 9738 4091

Lab Sample ID: T870Q
LIMS ID: 97-17212
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MB
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	63.6
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	0.89

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD006-0000

Sample No: 9738 4093

Lab Sample ID: T870R
LIMS ID: 97-17213
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: JMB Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	45.9
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	12

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD007-0000

Sample No: 9738 4094

Lab Sample ID: T870S
LIMS ID: 97-17214
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: JMB
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	47.6
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD008-0000

Sample No: 9738 4095

Lab Sample ID: T870T
LIMS ID: 97-17215
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MAP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.2
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD009-0000

Sample No: 9738 4096

Lab Sample ID: T870U
LIMS ID: 97-17216
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	48.4
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD010-0000

Sample No: 9738 4097

Lab Sample ID: T870V
LIMS ID: 97-17217
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized:
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	51.2
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD012-0000

Sample No: 9738 4098

Lab Sample ID: T870W
LIMS ID: 97-17218
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Date Sampled: 09/18/97
Data Release Authorized: MB Date Received: 09/20/97
Reported: 10/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	65.0
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD013-0000

Sample No: 9738 4099

Lab Sample ID: T870X
LIMS ID: 97-17219
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MAP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	50.0
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD- SD014-0000

Sample No: 9738 4100

Lab Sample ID: T870Y
LIMS ID: 97-17220
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized:
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	49.8
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

WR-SD-SD034-0000

Sample No: 9738 4101

Lab Sample ID: T870Z
LIMS ID: 97-17221
Matrix: Sediment

QC Report No: T870-Roy F. Weston
Project: 04000-019-036-5100-00

Data Release Authorized: MP
Reported: 10/17/97 Dr. M.A. Perkins

Date Sampled: 09/18/97
Date Received: 09/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	09/24/97 092497#1	EPA 160.3 SM 2540 B		0.01	Percent	50.0
Total Organic Carbon	09/26/97 092697#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit

Report for T870 received 09/20/97

JMB 12/15/97

Roy F. Weston, Inc.
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JAN 16 1998
Environmental Cleanup Office

MEMORANDUM

DATE: 9 January 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: T914
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AAAT

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 55 samples, SDG T914, collected from the Willamette River has been completed. The sediment samples were analyzed for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97384103	97384104	97384105	97384106	97384108
97384109	97384901	97384903	97384904	97384905
97384906	97384907	97384908	97384909	97384910
97384911	97384912	97384913	97384915	97384916
97384917	97384919	97384921	97384922	97384924
97384925	97384926	97384927	97384928	97384929
97384930	97384933	97384934	97384935	97384937
97384938	97384939	97384940	97384941	97384943
97384944	97384945	97384947	97384950	97384952

100869

97384954	97384956	97384958	97384960	97384961
97384963	97384964	97384965	97384966	97384967

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract.

1. Holding Times

   All samples were analyzed within holding time criteria.

2. Instrument Detection Limits

   Laboratory reporting limits (RL) are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration Verification

   All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

   a. Laboratory Method Blanks

      No analytes were detected in laboratory method blanks.

   b. Field Blanks

      No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

   The recoveries for TOC were within the control limits of 70 - 130 percent.

6. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results met QC limit of 35 percent for concentrations greater than 5 times the quantitation limit.

7. Spiked Sample Analysis

The matrix spike recovery for sample 97384956 was outside QC limits of 75 to 125 percent:

Analyte	Percent Recovery	Associated Samples			
TOC	66.3	97384956	97384958	97384960	97384961
		97384963	97384964	97384965	97384966
		97384967			

Positive results for samples associated with this matrix spike analysis were qualified as estimated (J).

8. Field Duplicate Analysis

Samples 97384913/97384915 and 97384941/97384943 were field duplicates. Results exhibited acceptable agreement.

9. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the CRDL or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4103
WR-SD-SD036-0000

Lab Sample ID: T914A
LIMS ID: 97-17585
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/19/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.6
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4104
WR-SD-SD040-0000

Lab Sample ID: T914B
LIMS ID: 97-17586
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4105
WR-SD-SD042-0000

Lab Sample ID: T914C
LIMS ID: 97-17587
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	46.2
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4106
WR-SD-SD049-0000

Lab Sample ID: T914D
LIMS ID: 97-17588
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/19/97
Data Release Authorized: MB Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4108

WR-SD-SD051-0000

Lab Sample ID: T914E
LIMS ID: 97-17589
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.8
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4109
WR-SD-SD053-0000

Lab Sample ID: T914F
LIMS ID: 97-17590
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.1
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4901
WR-SD-SD056-0000

Lab Sample ID: T914G
LIMS ID: 97-17591
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/19/97
Data Release Authorized: MP
Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4903
WR-SD-SD037-8000

Lab Sample ID: T914H
LIMS ID: 97-17592
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	46.9
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 1/7/98

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4904
WR-SD-SD038-0000

Lab Sample ID: T914I
LIMS ID: 97-17593
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized: MB
Reported: 10/31/97 Dr. M.A. Perkins
Date Sampled: 09/19/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	43.9
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

MB 11/12/98

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4905
WR-SD- SD039-0000

Lab Sample ID: T914J
LIMS ID: 97-17594
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	46.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

JMB 11/7/98

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4906
WR-SD-SD041-0000

Lab Sample ID: T914K
LIMS ID: 97-17595
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.4
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000063 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4907
WR-SD-SD043-0000

Lab Sample ID: T914L
LIMS ID: 97-17596
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized: MA
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.6
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000364 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4908
WR-SD-SD044-0000

Lab Sample ID: T914M
LIMS ID: 97-17597
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized: MB
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.2
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000365 MB 11/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97384909
WR-SD-SD045-0000

Lab Sample ID: T923A
LIMS ID: 97-17682
Matrix: Sediment

QC Report No: T923-Roy F. Weston
Project: PSR

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized: MS
Reported: 11/03/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/02/97 100297#1	EPA 160.3 SM 2540 B		0.01	Percent	51.7
Total Organic Carbon	10/07/97 100797#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T923 received 09/24/97

000103 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97384910
WR-SD-SD047-0000

Lab Sample ID: T923B
LIMS ID: 97-17683
Matrix: Sediment
Data Release Authorized:
Reported: 11/03/97 Dr. M.A. Perkins

QC Report No: T923-Roy F. Weston
Project: PSR
Date Sampled: 09/19/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/02/97 100297#1	EPA 160.3 SM 2540 B		0.01	Percent	57.5
Total Organic Carbon	10/07/97 100797#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T923 received 09/24/97

090104 11/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97384911
WR-SD-SD046-0000

Lab Sample ID: T923C
LIMS ID: 97-17684
Matrix: Sediment
Data Release Authorized:
Reported: 11/03/97 Dr. M.A. Perkins

QC Report No: T923-Roy F. Weston
Project: PSR
Date Sampled: 09/19/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/02/97 100297#1	EPA 160.3 SM 2540 B		0.01	Percent	52.2
Total Organic Carbon	10/07/97 100797#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T923 received 09/24/97

000105 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97384912
WR-SD-SD050-6000

Lab Sample ID: T923D
LIMS ID: 97-17685
Matrix: Sediment
QC Report No: T923-Roy F. Weston
Project: PSR
Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 11/03/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/02/97 100297#1	EPA 160.3 SM 2540 B		0.01	Percent	55.4
Total Organic Carbon	10/07/97 100797#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T923 received 09/24/97

000106 MB 11/7/98

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4913
WR-SD-SD048-0000

Lab Sample ID: T914N
LIMS ID: 97-17598
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	57.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4915
WR-SD-SD048-1000

Lab Sample ID: T9140
LIMS ID: 97-17599
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized: DMP
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000367 JMP 11/7/98

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ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4916
WR-SD-SD052-0000

Lab Sample ID: T914P
LIMS ID: 97-17600
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/19/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.1
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000363 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4917
WR-SD-SD055-0000

Lab Sample ID: T914Q
LIMS ID: 97-17601
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/19/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	70.5
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4919
WR-SD-SD057-0000

Lab Sample ID: T914R
LIMS ID: 97-17602
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized: MAP
Reported: 10/31/97 Dr. M.A. Perkins
Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.0
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4921
WR-SD-SD059-0000

Lab Sample ID: T914S
LIMS ID: 97-17603
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.1
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4922
WR-SD-SD058-0000

Lab Sample ID: T914T
LIMS ID: 97-17604
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	65.4
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	2.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4924
WR-SD-SD061-0000

Lab Sample ID: T914U
LIMS ID: 97-17605
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	43.9
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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01403

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4925
WR-SD-SD060-0000

Lab Sample ID: T914V
LIMS ID: 97-17606
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.0
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	0.93

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01404

000074 MB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4926
WR-SD-SD066-0006

Lab Sample ID: T914W
LIMS ID: 97-17607
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins
Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	60.2
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000075 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4927
WR-SD-SD071-0000

Lab Sample ID: T914X
LIMS ID: 97-17608
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	51.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01406

000076 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4928
WR-SD-SD073-0000

Lab Sample ID: T914Y
LIMS ID: 97-17609
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized: MP
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	44.0
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01407

000077 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4929
WR-SD-SD076-0000

Lab Sample ID: T914Z
LIMS ID: 97-17610
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	45.0
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4930
WR-SD-SD074-0000

Lab Sample ID: T914AA
LIMS ID: 97-17611
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	43.8
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4933

WR-SD-SD062-0000

Lab Sample ID: T914AB
LIMS ID: 97-17612
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.6
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	2.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4934
WR-SD-SD063-0000

Lab Sample ID: T914AC
LIMS ID: 97-17613
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized: MK
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.8
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01411

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4935
WR-SD-SD064-000C

Lab Sample ID: T914AD
LIMS ID: 97-17614
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Date Sampled: 09/20/97
Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	44.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	2.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01412

000382 MB 1/2/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4937

WR-SD-SD065-0000

Lab Sample ID: T914AE
LIMS ID: 97-17615
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.1
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01413

000083 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4938

WR-SD-SD067-0000

Lab Sample ID: T914AF
LIMS ID: 97-17616
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.3
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01414

000084 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4939
WR-SD-SD068-0000

Lab Sample ID: T914AX
LIMS ID: 97-17617
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000385 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4940
WR-SD-SD069-000C

Lab Sample ID: T914AY
LIMS ID: 97-17618
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/20/97
Data Release Authorized:
Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	52.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01416

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4941
WR-SD-SD070-0000

Lab Sample ID: T914AG
LIMS ID: 97-17619
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	56.9
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01417

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4943

WR-SD-SD070-1000

Lab Sample ID: T914AH
LIMS ID: 97-17620
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	57.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01418

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4944
WR-SD-SD072-0000

Lab Sample ID: T914AI
LIMS ID: 97-17621
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/20/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	56.9
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	0.97

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4945
WR-SD-SD075-0000

Lab Sample ID: T914AJ
LIMS ID: 97-17622
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/20/97
Data Release Authorized: MA Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.6
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	0.89

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000383 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4947
WR-SD-SD077-0000

Lab Sample ID: T914AK
LIMS ID: 97-17623
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/21/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

010203 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4950
WR-SD-SD078-0000

Lab Sample ID: T914AL
LIMS ID: 97-17624
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	62.2
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	0.98

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01422

000391 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4952
WR-SD-SD079-0000

Lab Sample ID: T914AM
LIMS ID: 97-17625
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized: MP
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/21/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	69.8
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000392 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4954
WR-SD-SD086-0000

Lab Sample ID: T914AN
LIMS ID: 97-17626
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	45.7
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4956
WR-SD-SD082-0000

Lab Sample ID: T914AO
LIMS ID: 97-17627
Matrix: Sediment
Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/21/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.6
Total Organic Carbon	10/08/97 100897#1	Plumb,1981		0.0050	Percent	1.4 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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01425

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4958
WR-SD-SD089-0000

Lab Sample ID: T914AP
LIMS ID: 97-17628
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Date Sampled: 09/21/97
Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.8
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.2 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000095 JMB 11/7/98

01426

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4960
WR-SD-SD091-0000

Lab Sample ID: T914AQ
LIMS ID: 97-17629
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/21/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	51.2
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.2 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4961
WR-SD-SD096-0000

Lab Sample ID: T914AR
LIMS ID: 97-17630
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/21/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	52.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.2 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4963
WR-SD-SD095-0000

Lab Sample ID: T914AS
LIMS ID: 97-17631
Matrix: Sediment
QC Report No: T914-Roy F. Weston
Project: 1001.006
Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.3 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4964
WR-SD-SD094-0000

Lab Sample ID: T914AT
LIMS ID: 97-17632
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Date Sampled: 09/21/97
Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	53.1
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.2 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4965
WR-SD-SD099-0000

Lab Sample ID: T914AU
LIMS ID: 97-17633
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Date Sampled: 09/21/97
Date Received: 09/24/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	45.5
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.6 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01431

000103 11/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4966
WR-SD-SD098-0000

Lab Sample ID: T914AV
LIMS ID: 97-17634
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/24/97
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.2
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.3 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

01432

090101 JMB 1/7/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4967
WR-SD-SD103-0000

Lab Sample ID: T914AW
LIMS ID: 97-17635
Matrix: Sediment

QC Report No: T914-Roy F. Weston
Project: 1001.006

Date Sampled: 09/21/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/03/97 100397#1	EPA 160.3 SM 2540 B		0.01	Percent	44.7
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.6 J

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T914 received 09/24/97

000102

01433

1/7/98

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 14 January 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: T971
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AAAU

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 68 samples, SDG T971, collected from the Willamette River has been completed. The sediment samples were analyzed for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97384968	97394715	97394731	97394748	97394764
97384970	97394716	97394732	97394749	97394765
97394700	97394718	97394733	97394750	97394766
97394702	97394719	97394734	97394751	97394767
97394704	97394720	97394736	97394752	97394768
97394705	97394722	97394738	97394753	97394770
97394706	97394723	97394739	97394755	97394771
97394707	97394724	97394741	97394756	97394772
97394708	97394725	97394742	97394758	97394775
97394710	97394726	97394743	97394759	97394776
97394711	97394727	97394744	97394760	97394777
97394712	97394728	97394745	97394761	97394778
97394713	97394729	97394746	97394762	
97394714	97394730	97394747	97394763	

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract.

1. Holding Times

   All samples were analyzed within holding time criteria.

2. Instrument Detection Limits

   Laboratory reporting limits (RL) are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration Verification

   All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

   a. Laboratory Method Blanks

      No analytes were detected in laboratory method blanks.

   b. Field Blanks

      No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

   The recoveries for TOC were within the control limits of 70-130%.

6. Laboratory Duplicate Sample Analysis

   All relative percent differences (RPD) between analytical results were within the QC limit of 35 percent for concentrations greater than five times the quantitation limit.

7. Spiked Sample Analysis

   Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

8. Field Duplicate Analysis

   Samples 97394712/97394713, 97394729/97394730, 97394750/97394751, 97394765/97394766, and 97394777/97394778 were field duplicates. Results exhibited acceptable agreement, with the exception of 97394712/97394713 (2.2% and 1.5% for an RPD = 37.8%). No action was taken because field duplicate results reflect field variability.

9. Laboratory Contact

   No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the CRDL or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4968 WR-SD-SD102-0000

Lab Sample ID: T971A
LIMS ID: 97-18025
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Data Release Authorized: MF
Reported: 11/04/97 Dr. M.A. Perkins

Date Sampled: 09/21/97
Date Received: 09/27/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.5
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01437

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061

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9738 4970 WR-SD-SD101-0000

Lab Sample ID: T971B
LIMS ID: 97-18026
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Date Received: 09/27/97

Data Release Authorized: JMB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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01438

062

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4700
WR-SD-SD080-0000

Lab Sample ID: T971C
LIMS ID: 97-18027
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.5
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01439

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4702

WR-SD-SD081-0000

Lab Sample ID: T971D
LIMS ID: 97-18028
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	59.1
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	0.90

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4704
WR-SD- SD083-0000

Lab Sample ID: T971E
LIMS ID: 97-18029
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: [signature] Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	40.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

065

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4705

WR-SD-SD084-0000

Lab Sample ID: T971F
LIMS ID: 97-18030
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	49.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01442

JMB 11/9/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4706
WR-SD-SD085-0000

Lab Sample ID: T971G
LIMS ID: 97-18031
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01443

JMB 1/9/98
067

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4707

WR-SD-SD087-0000

Lab Sample ID: T971H
LIMS ID: 97-18032
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.0
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01444

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068

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4708

WR-SD-SD088-0000

Lab Sample ID: T971I
LIMS ID: 97-18033
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/21/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.0
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01445

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069

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4710
WR-SD-SD090-0000

Lab Sample ID: T971J
LIMS ID: 97-18034
Matrix: Sediment
QC Report No: T971-Roy F. Weston
Project: 1001-006
Date Sampled: 09/21/97
Date Received: 09/27/97

Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	49.7
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01146

JMB 1/9/98
070

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4711
WR-SD-SD093-0000

Lab Sample ID: T971K
LIMS ID: 97-18035
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: MR Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	46.2
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	2.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01447

071 JMB 1/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4712

WR-SD-SD092-0000

Lab Sample ID: T971L
LIMS ID: 97-18036
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	68.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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072

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4713
WR-SD- SD092-1000

Lab Sample ID: T971M
LIMS ID: 97-18037
Matrix: Sediment
QC Report No: T971-Roy F. Weston
Project: 1001-006
Date Sampled: 09/22/97
Data Release Authorized: MAP Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	73.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01449

073 JMB 11/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4714

WR-SD- SD097-0000

Lab Sample ID: T971N
LIMS ID: 97-18038
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01150

074 11/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4715
WR-SD-SD100-0000

Lab Sample ID: T9710
LIMS ID: 97-18039
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Date Sampled: 09/22/97
Date Received: 09/27/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	59.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	0.75

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

JMB 1/9/98

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075

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4716
WR-SD- SD106-0000

Lab Sample ID: T971P
LIMS ID: 97-18040
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

JMB 11/9/98

01452

076

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4718
WR-SD-SD108-0000

Lab Sample ID: T971Q
LIMS ID: 97-18041
Matrix: Sediment
Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

QC Report No: T971-Roy F. Weston
Project: 1001-006
Date Sampled: 09/22/97
Date Received: 09/27/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	46.5
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

JMB 11/9/98

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4719
WR-SD-SD111-0000

Lab Sample ID: T971R
LIMS ID: 97-18042
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	46.8
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

JMB 11/9/98

078

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4720
WR-SD-SD116-0000

Lab Sample ID: T971S
LIMS ID: 97-18043
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01455

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079

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4722 WR-SD- SD119-0000

Lab Sample ID: T971T
LIMS ID: 97-18044
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	46.2
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

JMB 11/9/98

01156

080

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4723

WR-SD-SD122-0000

Lab Sample ID: T971U
LIMS ID: 97-18045
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.W. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	41.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01457

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081

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4724 WR-SD-SD121-0000

Lab Sample ID: T971V
LIMS ID: 97-18046
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	46.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01458

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092

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4725 WR-SD-SD129-0000

Lab Sample ID: T971W
LIMS ID: 97-18047
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	41.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

MB 11/9/98

083

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4726
WR-SD- SD134-0000

Lab Sample ID: T971X
LIMS ID: 97-18048
Matrix: Sediment
QC Report No: T971-Roy F. Weston
Project: 1001-006
Date Sampled: 09/22/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	36.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01460

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4727
WR-SD-SD136-0000

Lab Sample ID: T971Y
LIMS ID: 97-18049
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	69.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01461

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4728
WR-SD-SD139-0000

Lab Sample ID: T971Z
LIMS ID: 97-18050
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	33.7
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01462

086 gmb 11/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4729
WR-SD-SD141-0000

Lab Sample ID: T971AA
LIMS ID: 97-18051
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	33.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01463

087 MB 12/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4730 WR-SD- SD141-1000

Lab Sample ID: T971AB
LIMS ID: 97-18052
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Data Release Authorized: MR Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	34.8
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01464

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4731 WR-SD- SD148-0000

Lab Sample ID: T971AC
LIMS ID: 97-18053
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/22/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	49.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01465

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4732 WR-SD-SD124-0000

Lab Sample ID: T971AD
LIMS ID: 97-18054
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized: MP
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.7
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01466

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4733

WR-SD- SD126-0000

Lab Sample ID: T971AE
LIMS ID: 97-18055
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Date Sampled: 09/23/97
Date Received: 09/27/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	38.1
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4734

WR-SD- SD128-0000

Lab Sample ID: T971AF
LIMS ID: 97-18056
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: MP Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	42.1
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01468

092 MB 12/9/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4736
WR-SD-SD125-0000

Lab Sample ID: T971AG
LIMS ID: 97-18057
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: MS Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	44.4
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01469

093 MB 11/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4738

WR-SD- SD127-0000

Lab Sample ID: T971AH
LIMS ID: 97-18058
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.2
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4739
WR-SD- SD130-0000

Lab Sample ID: T971AI
LIMS ID: 97-18059
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.5
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4741

WR-SD- SD104-0000

Lab Sample ID: T971AJ
LIMS ID: 97-18060
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01472

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4742 WR-SD-SD105-0000

Lab Sample ID: T971AK
LIMS ID: 97-18061
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	43.3
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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01473

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4743

WR-SD - SD107-0000

Lab Sample ID: T971AL
LIMS ID: 97-18062
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	41.9
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

098 MB 11/9/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4744
WR-SD-SD109-0000

Lab Sample ID: T971AM
LIMS ID: 97-18063
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	43.6
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4745 WR-SD-SD110-0000

Lab Sample ID: T971AN
LIMS ID: 97-18064
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Date Sampled: 09/23/97
Date Received: 09/27/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	44.7
Total Organic Carbon	10/09/97 100997#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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MB 1/9/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4746
WR-SD- SD112-0000

Lab Sample ID: T971AO
LIMS ID: 97-18065
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	44.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4747
WR-SD- SD113-0000

Lab Sample ID: T971AP
LIMS ID: 97-18066
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	43.6
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4748
WR-SD-SD114-0000

Lab Sample ID: T971AQ
LIMS ID: 97-18067
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	70.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	0.72

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4749
WR-SD-SD115-0000

Lab Sample ID: T971AR
LIMS ID: 97-18068
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	44.3
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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MB 11/4/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4750
WR-SD- SD117-0000

Lab Sample ID: T971AS
LIMS ID: 97-18069
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	56.7
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	0.78

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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11/9/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4751
WR-SD-SD117-1000

Lab Sample ID: T971AT
LIMS ID: 97-18070
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	58.0
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	0.75

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4752
WR-SD- SD118-0000

Lab Sample ID: T971AU
LIMS ID: 97-18071
Matrix: Sediment
QC Report No: T971-Roy F. Weston
Project: 1001-006
Date Sampled: 09/23/97
Data Release Authorized: MB
Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	55.9
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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MB 11/9/98

01483

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4753
WR-SD-SD133-0000

Lab Sample ID: T971AV
LIMS ID: 97-18072
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.3
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4755 WR-SD-SD132-0000

Lab Sample ID: T971AX
LIMS ID: 97-18073
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Date Received: 09/27/97

Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	52.3
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4756
WR-SD-SD020-0000

Lab Sample ID: T971AY
LIMS ID: 97-18074
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/23/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	49.0
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4758 WR-SD-SD138-0000

Lab Sample ID: T971AZ
LIMS ID: 97-18075
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.9
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01487

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4759
WR-SD- SD145-0000

Lab Sample ID: T971BA
LIMS ID: 97-18076
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized: MS
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	54.3
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

01488

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4760
WR-SD-SD1SD-0000

Lab Sample ID: T971BB
LIMS ID: 97-18077
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	56.2
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	0.89

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4761
WR-SD- SD120-0000

Lab Sample ID: T971BC
LIMS ID: 97-18078
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	43.0
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4762
WR-SD-SD123-0000

Lab Sample ID: T971BD
LIMS ID: 97-18079
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: MB Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	48.4
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4763
WR-SD-SD131-0000

Lab Sample ID: T971BE
LIMS ID: 97-18080
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	49.7
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4764
WR-SD-SD135-00000

Lab Sample ID: T971BF
LIMS ID: 97-18081
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	51.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4765

WR-SD-SD137-0000

Lab Sample ID: T971BG
LIMS ID: 97-18082
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	50.1
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4766
WR-SD-SD137-1000

Lab Sample ID: T971BH
LIMS ID: 97-18083
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	48.9
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4767 WR-SD- SD140-0000

Lab Sample ID: T971BI
LIMS ID: 97-18084
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	48.6
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Sample No: 9739 4768
WR-SD- SD142-0000

Lab Sample ID: T971BJ
LIMS ID: 97-18085
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized:
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	41.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4770 WR-SD-SD143-0000

Lab Sample ID: T971BK
LIMS ID: 97-18086
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	55.1
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Final Report
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Sample No: 9739 4771
WR-SD-SD144-0000

Lab Sample ID: T971BL
LIMS ID: 97-18087
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	40.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9739 4772

WR-SD- SD146-0000

Lab Sample ID: T971BM
LIMS ID: 97-18088
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	45.9
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for T971 received 09/27/97

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4775

WR-SD-SD147-0000

Lab Sample ID: T971BN
LIMS ID: 97-18089
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized: MP
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	44.8
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Sample No: 9739 4776

WR-SD-SD149-0000

Lab Sample ID: T971BO
LIMS ID: 97-18090
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: MP Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	43.4
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4777 WR-SD-SD151-0000

Lab Sample ID: T971BP
LIMS ID: 97-18091
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Data Release Authorized: Date Received: 09/27/97
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.2
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.5

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 9739 4778 WR-SD-SD151-1000

Lab Sample ID: T971BQ
LIMS ID: 97-18092
Matrix: Sediment

QC Report No: T971-Roy F. Weston
Project: 1001-006

Date Sampled: 09/24/97
Date Received: 09/27/97

Data Release Authorized: MB
Reported: 11/04/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/07/97 100797#1	EPA 160.3 SM 2540 B		0.01	Percent	47.4
Total Organic Carbon	10/10/97 101097#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 3 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: U199
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABT

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 14 samples, SDG U199, collected from the Willamette River has been completed. The sediment samples were analyzed at low level for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97424913	97424915	97424916	97424918	97424919
97424920	97424921	97424923	97424925	97424927
97424929	97424931	97424933	97424935	

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control specifications described in the technical specifications of the laboratory subcontract.

1. Holding Times

All samples met holding time criteria.

2. Instrument Detection Limits

All laboratory reporting limits are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration

All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

a. Laboratory Method Blanks

No analytes were detected in laboratory method blanks.

b. Field Blanks

No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

The recoveries for TOC were within the control limits of 70-130%.

6. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 35 percent for concentrations greater than five times the quantitation limit.

7. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

8. Field Duplicate Analysis

Samples 97424915 and 97424916 were field duplicates. Results exhibited reasonable agreement.

9. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

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Final Report
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Sample No: 97424913 WR-SD-SD049-0000A

Lab Sample ID: U199A
LIMS ID: 97-19616
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/17/97

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	55.2
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 97424915 WR-SD-SD048-0000A

Lab Sample ID: U199B
LIMS ID: 97-19617
Matrix: Sediment
Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

QC Report No: U199-REGL, LLC
Project: 1001-006
Date Sampled: 10/15/97
Date Received: 10/17/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	58.6
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 97424916

WR-SD-SD048-1000A

Lab Sample ID: U199C
LIMS ID: 97-19618
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Data Release Authorized: Date Received: 10/17/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	56.2
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424918 WR-SD-SD055-0000A

Lab Sample ID: U199D
LIMS ID: 97-19619
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/17/97

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	59.6
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424919 WR-SD-SD053-0000A

Lab Sample ID: U199E
LIMS ID: 97-19620
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/17/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	57.6
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424920 WR-SD-SD133-0000A

Lab Sample ID: U199F
LIMS ID: 97-19621
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Data Release Authorized: Date Received: 10/17/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.8
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424921 WR-SD-SD127-0000A

Lab Sample ID: U199G
LIMS ID: 97-19622
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Data Release Authorized: Date Received: 10/17/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.0
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 97424923 WR-SD-SD122-0000 A

Lab Sample ID: U199H
LIMS ID: 97-19623
Matrix: Sediment
QC Report No: U199-REGL, LLC
Project: 1001-006
Date Sampled: 10/16/97
Data Release Authorized: MR Date Received: 10/17/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.4
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

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Laboratory Analysis of Conventional Parameters

Sample No: 97424925 WR-SD-SD125-0000A

Lab Sample ID: U199I
LIMS ID: 97-19624
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Data Release Authorized: MMP
Reported: 11/12/97 Dr. M.A. Perkins

Date Sampled: 10/16/97
Date Received: 10/17/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	47.0
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	2.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

JMB 1/21/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424927 WR-SD-SD116-0000A

Lab Sample ID: U199J
LIMS ID: 97-19625
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/17/97

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	48.4
Total Organic Carbon	10/30/97 103097#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

MB 12/1/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424929 WR-SD-SD106-0000A

Lab Sample ID: U199K
LIMS ID: 97-19626
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/17/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.4
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	2.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

JMB 1/21/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424931

WR-SD-SD102-0000A

Lab Sample ID: U199L
LIMS ID: 97-19627
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/17/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	59.6
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

JMB 1/21/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424933 WR-SD-SD096-0000A

Lab Sample ID: U199M
LIMS ID: 97-19628
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Data Release Authorized: Date Received: 10/17/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	60.1
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

JMB 1/21/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424935 WR-SD- SD057-0000A

Lab Sample ID: U199N
LIMS ID: 97-19629
Matrix: Sediment

QC Report No: U199-REGL, LLC
Project: 1001-006

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Date Sampled: 10/16/97
Date Received: 10/17/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	58.8
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U199 received 10/17/97

JMB 1/21/98

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 4 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: U175
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABR

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 9 samples, SDG U175, collected from the Willamette River has been completed. The sediment samples were analyzed at low level for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97424900	97424902	97424903	97424904	97424906
97424907	97424909	97424910	97424912	

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control specifications described in the technical specifications of the laboratory subcontract.

1. Holding Times

All samples met holding time criteria.

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2. Instrument Detection Limits

All laboratory reporting limits are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration

All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

a. Laboratory Method Blanks

No analytes were detected in laboratory method blanks.

b. Field Blanks

No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

The recoveries for TOC were within the control limits of 70 to 130%.

6. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 35 percent for concentrations greater than five times the quantitation limit.

7. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

8. Field Duplicate Analysis

No field duplicate samples were associated with this sample delivery group.

9. Laboratory Contact

No laboratory contract was required.

JRM

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424900 WR-SD-SD001-0000A

Lab Sample ID: U175A
LIMS ID: 97-19474
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/14/97
Date Received: 10/16/97

Data Release Authorized: MB
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	55.2
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	3.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

JMB 1/27/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424902 WR-SD-SD074-0000A

Lab Sample ID: U175C
LIMS ID: 97-19476
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Date Sampled: 10/14/97
Date Received: 10/16/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	48.4
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	3.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

JMB 1/27/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424903 WR-SD-SD136-0000A

Lab Sample ID: U175D
LIMS ID: 97-19477
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/14/97
Date Received: 10/16/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	63.2
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

JMB 1/27/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424904 WR-SD-SD141-0000A

Lab Sample ID: U175E
LIMS ID: 97-19478
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/14/97
Date Received: 10/16/97

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	48.8
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	2.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

JMB 11/27/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424906 WR-SD-SD138-0000A

Lab Sample ID: U175G
LIMS ID: 97-19480
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Data Release Authorized: MP
Reported: 11/12/97 Dr. M.A. Perkins

Date Sampled: 10/14/97
Date Received: 10/16/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	51.6
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	2.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

MP 11/27/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424907 WR-SD-SD013-0000A

Lab Sample ID: U175H
LIMS ID: 97-19481
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/16/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	55.7
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	2.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

11/12/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424909
WR-SD-SD007-0000A

Lab Sample ID: U175I
LIMS ID: 97-19482
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/16/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	56.3
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	2.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

11/27/98
500

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424910 WR-SD-SD017-0000A

Lab Sample ID: U175J
LIMS ID: 97-19483
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Date Received: 10/16/97

Data Release Authorized:
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	55.9
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	2.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 97424912 WR-SD-SD035-0000A

Lab Sample ID: U175L
LIMS ID: 97-19485
Matrix: Sediment

QC Report No: U175-REGL, LLC
Project: 1001-006

Date Sampled: 10/15/97
Data Release Authorized: Date Received: 10/16/97
Reported: 11/12/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/20/97 102097#1	EPA 160.3 SM 2540 B		0.01	Percent	52.6
Total Organic Carbon	10/23/97 102397#1	Plumb,1981		0.0050	Percent	3.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U175 received 10/16/97

01532

12/7/98
502

Roy F. Weston, Inc.
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700 5th Avenue
Seattle, Washington 98104-5057
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MEMORANDUM

DATE: 4 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Total Organic Carbon Analysis Results
SDG: U203
Site: Willamette River

WORK ASSIGNMENT NO.:46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABN

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 16 samples, SDG U203, collected from the Willamette River has been completed. The sediment samples were analyzed at low level for total organic carbon (TOC) by Analytical Resources, Inc. (ARI), of Seattle, WA. The samples were numbered:

97424937	97424939	97424941	97424942	97424943
97424944	97424945	97424947	97424948	97424949
97424951	97424953	97424954	97424956	97424958
97424960				

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control specifications described in the technical specifications of the laboratory subcontract.

1. Holding Times

All samples met holding time criteria.

2. Instrument Detection Limits

All laboratory reporting limits are equal to or less than the project-required detection limits.

3. Initial and Continuing Calibration

All results met control limits of 90 to 110 percent recovery of the true value for both initial and continuing calibration.

4. Blanks

a. Laboratory Method Blanks

No analytes were detected in laboratory method blanks.

b. Field Blanks

No field blank samples were associated with this sample delivery group.

5. Laboratory Control Sample

The recoveries for TOC were within the control limits of 70-130%.

6. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 35 percent for concentrations greater than 5 times the quantitation limit.

7. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

8. Field Duplicate Analysis

Samples 97424942 and 97424943 were field duplicates. Results exhibited reasonable agreement.

9. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
RESOURCES
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Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4937 WR-SD-SD092-0000A

Lab Sample ID: U203A
LIMS ID: 97-19725
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized: MP
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	54.2
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	2.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

JMB 1/20/98

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ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4939 WR-SD-SD100-0000A

Lab Sample ID: U203C
LIMS ID: 97-19727
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	51.1
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

JMB 1/20/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4941 WR-SD-SD090-0000A

Lab Sample ID: U203E
LIMS ID: 97-19729
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Data Release Authorized: MP
Reported: 11/17/97 Dr. M.A. Perkins

Date Sampled: 10/16/97
Date Received: 10/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.2
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

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1928 JMB 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4942 WR-SD-SD084-0000A

Lab Sample ID: U203F
LIMS ID: 97-19730
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.2
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.4

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

JMB 1/2019

1929

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4943

WR-SD-SD084-1000A

Lab Sample ID: U203G
LIMS ID: 97-19731
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	50.9
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.9

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01540

1930 1/20/98

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4944 WR-SD-SD031-0000A

Lab Sample ID: U203H
LIMS ID: 97-19732
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Date Sampled: 10/17/97
Date Received: 10/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	52.8
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	2.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

1931 1/20

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4945

WR-SD-SD023-0000A

Lab Sample ID: U203I
LIMS ID: 97-19733
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/17/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	56.4
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

JMB 1932 1/20

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4947 WR-SD- SD072-0000A

Lab Sample ID: U203K
LIMS ID: 97-19735
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	59.6
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.2

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01543

1933 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4948 WR-SD-SD081-0000A

Lab Sample ID: U203L
LIMS ID: 97-19736
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	57.1
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

1934 JME 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4949
WR-SD-SD117-0000A

Lab Sample ID: U203M
LIMS ID: 97-19737
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	61.1
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.3

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

1935 JME 1/20

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4951

WR-SD-SD120-0000A

Lab Sample ID: U2030
LIMS ID: 97-19739
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Date Sampled: 10/16/97
Date Received: 10/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	52.2
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.8

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01546

1936 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4953

WR-SD-SD071-0000A

Lab Sample ID: U203Q
LIMS ID: 97-19741
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized: Dr. M.A. Perkins
Reported: 11/17/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	49.9
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01547

1937 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4954 WR-SD-SD035-0000A

Lab Sample ID: U203R
LIMS ID: 97-19742
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Date Sampled: 10/16/97
Date Received: 10/20/97

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	53.9
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.7

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01548

1938 JMB 11/20/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4956 WR-SD-SD1SD-0000A

Lab Sample ID: U203T
LIMS ID: 97-19744
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	60.9
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	1.1

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01549

1939 JMB 12/2/97

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4958

WR-SD-SD143-0000A

Lab Sample ID: U203V
LIMS ID: 97-19746
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	53.5
Total Organic Carbon	11/04/97 110497#1	Plumb,1981	3.0	0.015	Percent	5.6

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01550

1940 JME 11/20

ANALYTICAL
RESOURCES
INCORPORATED

Final Report
Laboratory Analysis of Conventional Parameters

Sample No: 9742 4960 WR-SD-SD151-0000A

Lab Sample ID: U203X
LIMS ID: 97-19748
Matrix: Sediment

QC Report No: U203-REGL, LLC
Project: 1001-006

Date Sampled: 10/16/97
Date Received: 10/20/97

Data Release Authorized:
Reported: 11/17/97 Dr. M.A. Perkins

Analyte	Analysis Date/Batch	Method	Dilution Factor	RL	Units	Result
Total Solids	10/23/97 102397#1	EPA 160.3 SM 2540 B		0.01	Percent	52.5
Total Organic Carbon	11/04/97 110497#1	Plumb,1981		0.0050	Percent	2.0

RL Analytical reporting limit
U Undetected at reported detection limit
B Analyte found in method blank above detection

Report for U203 received 10/20/97

01551

1911 jmb 1/20/98

Porewater

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 3 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Inorganic Data
SDG No: T976
Site: Willamette River

WORK ASSIGNMENT NO.: 46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABV

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 18 samples, SDG T976, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for inorganics by Analytical Resources, Inc., of Seattle, WA. The samples were numbered:

97384932	97394769	97384949	97384962	97394721
97384959	97394717	97394740	97394737	97394757
97384900	97384902	97384923	97384914	97384931
97384942	97384920	97384936		

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA OSWER 9240.1-05-01, February 1994).

1. Holding Times

   All samples met holding time criteria.

2. Calibration

   a. Initial Calibration

      Initial calibration frequencies and QC criteria were met.

   b. CRI/CRA Standards

      Instrument calibration near the project-required detection limit was verified and met recovery criteria for all analytes.

   c. Initial and Continuing Calibration Verification

      All inductively coupled plasma (ICP) results met control limits of 90 to 110 percent recovery (percent R) of the true values for both initial and continuing calibration.

      Mercury cold vapor AA (CVAA) results met control limits of 80 to 120 percent recovery (percent R) for both initial and continuing calibration.

3. Instrument Detection Limits

   All instrument detection limits (IDL) for ICP and mercury analyses are equal to or less than the project-required detection limits.

4. Blanks

   a. Laboratory Method Blanks

      No analytes were detected in laboratory method blanks.

   b. Initial Calibration and Continuing Calibration Blanks

The following elements were found in calibration blanks.

Blank ID	Analyte	Concentration (µg/L)	Associated Samples
ICB	Thallium	-1.1	None
CCB4	Copper	2.1	None
CCB5	Thallium	-1.1	None
CCB6	Copper	2	None
CCB9	Selenium	1.1	None
CCB10	Thallium	1.2	None
CCB11	Thallium	1.3	None
CCB12	Thallium	-1.3	None
CCB14	Thallium	-1.3	None
2CCB2	Thallium	-1.2	None
2CCB6	Thallium	-1.2	None

No qualifiers were assigned.

c. Field Blanks

No field blank samples were associated with this sample delivery group.

5. ICP Interference Check

All analytes for the interference check samples were within the control limits of 80 to 120 percent of the true values.

6. Laboratory Control Sample

The recoveries for all analytes for both ICP and AA analysis were within the control limits of 80 to 120 percent for water.

7. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 20 percent (or $\pm$ 2 times the detection limit for concentrations < 5 times the detection limit).

8. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

9. ICP Serial Dilution

The percent differences (percent D) for ICP serial dilution analysis were within the QC limits of 10 percent for all parameters.

10. Field Duplicate Analysis

Samples 97384931 and 97384932 were field duplicates. Results exhibited reasonable agreement, with the exception of aluminum (106.17 RPD) and iron (106.49 RPD). No data were qualified since field duplicates reflect field variations in sample concentrations.

11. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

JRM

01556

ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4932

WR-RW-SD074-1000

Lab Sample ID: T976A
LIMS ID: 97-18134
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.62**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.004**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.055**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**41.6**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.004**
CLP	10/21/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.003**
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**7.44**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**12.0**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**3.68**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.2**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**11.0**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.008**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: ~~9738~~ 4769 9739
SD

WR-PW-SD143-0000

Lab Sample ID: T976B
LIMS ID: 97-18135
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.03**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.187**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**145**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.020**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**43.4**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**48.4**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**15.2**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**5.1**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.6**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.005**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.010**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET **Sample No: 9738 4949**
TOTAL METALS

WR-PW-SD077-0000

Lab Sample ID: T976C
LIMS ID: 97-18136
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.61**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.030**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**14.3**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**5.04**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**6.03**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**1.56**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**1.2**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.1**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.008**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET **Sample No: 9738 4962**
TOTAL METALS

WR-PW-SD096-0000

Lab Sample ID: T976D
LIMS ID: 97-18137
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.06**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.054**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**48.5**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.006**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**4.18**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**16.3**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**3.85**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.0**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**10.4**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.007**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9739 4721

WR-PW-SD116-0000

Lab Sample ID: T976E
LIMS ID: 97-18138
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.04**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.108**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**107**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.015**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**10.9**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**37.8**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**12.4**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.2**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.7**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.008**

U Analyte undetected at given RL

RL Reporting Limit

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01561

JMB 1/22/98

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4959

WR-PW-SD089-0000

Lab Sample ID: T976F
LIMS ID: 97-18139
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.10**	
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05	U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**	
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.107**	
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002	U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**96.3**	
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005	U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.012**	
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002	U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**11.5**	
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**32.4**	
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**10.3**	
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001	U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01	U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.5**	
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001	U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002	U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**13.0**	
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**	
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.007**	

U Analyte undetected at given RL

RL Reporting Limit

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JMB 11/22/97

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9739 4717

WR-PW-SD106-0000

Lab Sample ID: T976G
LIMS ID: 97-18140
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.03**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.001**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.123**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**115**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.014**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**5.11**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**40.3**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**12.9**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.6**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**13.6**
CLP	10/21/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.005**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9739 4740

WR-PW-SD130-0000

Lab Sample ID: T976H
LIMS ID: 97-18141
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.03**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.162**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**124**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.018**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**13.7**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**42.7**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**15.9**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**4.4**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.2**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.008**

U Analyte undetected at given RL

RL Reporting Limit

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01564

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9739 4737

WR-PW-SD125-0000

Lab Sample ID: T976I
LIMS ID: 97-18142
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	7429-90-5	Aluminum	0.02	0.02 U
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.115**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**94.2**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.014**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**4.88**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**34.9**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**11.5**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	**7440-02-0**	**Nickel**	0.01	**0.01**
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.9**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**18.9**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.011**

U Analyte undetected at given RL

RL Reporting Limit

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JMB 1/22/98

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9739 4757

WR-PW-SD020-0000

Lab Sample ID: T976J
LIMS ID: 97-18143
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.12**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.138**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**122**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.015**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**8.95**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**41.8**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**14.2**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.9**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**15.5**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.004**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.005**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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01566

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4900

WR-PW-SD053-0000

Lab Sample ID: T976K
LIMS ID: 97-18144
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.05**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.001**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.109**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**108**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.008**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**1.83**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**37.9**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**10.5**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.9**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**15.5**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.005**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01567

JMB 1/22/98

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ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4902

WR-PW-SD056-0000

Lab Sample ID: T976L
LIMS ID: 97-18145
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.61**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.008**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.057**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**52.2**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.008**
CLP	10/21/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.003**
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**24.0**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**17.4**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**5.25**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.3**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**13.8**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.012**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01568

JMB 11/22/98

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4923

WR-PW- SD058-0000

Lab Sample ID: T976M
LIMS ID: 97-18146
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.24**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.045**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**25.8**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	7440-48-4	Cobalt	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**2.21**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**15.0**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**2.66**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.1**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**10.1**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.010**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

JMB 1/22/19

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: 9738 4914**
TOTAL METALS

WR-PW-SD048-0000

Lab Sample ID: T976N
LIMS ID: 97-18147
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.08**	
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05	U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**	
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.082**	
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002	U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**71.4**	
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005	U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.007**	
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002	U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**5.83**	
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**24.1**	
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**7.27**	
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001	U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01	U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.8**	
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001	U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002	U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**15.6**	
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001	U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003	U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.008**	

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

JMB 11/22/98

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4931

WR-PW- SD074-0000

Lab Sample ID: T976O
LIMS ID: 97-18148
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.19**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.053**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**38.9**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.004**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**2.27**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.001**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**11.3**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**3.32**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.2**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**11.1**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.006**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01571

JMB 1/22/98

251

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4942

WR-PW-SD070-0000

Lab Sample ID: T976P
LIMS ID: 97-18149
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**1.00**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.047**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**22.8**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.005**
CLP	10/21/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.003**
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**5.06**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.002**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**7.78**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**2.07**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**1.7**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.7**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.009**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01572

JMB 1/22/98

252

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET **Sample No: 9738 4920**
TOTAL METALS

WR-PW-SD057-0000

Lab Sample ID: T976Q
LIMS ID: 97-18150
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.07**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.001**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.096**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**84.3**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.008**
CLP	10/21/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**0.49**
CLP	10/21/97	7421	10/22/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**29.5**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**7.57**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.3**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**16.4**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.006**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01573

JMB 1/22/9

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 9738 4936

WR-PW-SD064-0000

Lab Sample ID: T976R
LIMS ID: 97-18151
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 11/12/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/21/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**3.66**
CLP	10/21/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/21/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.009**
CLP	10/21/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.129**
CLP	10/21/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/21/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**66.6**
CLP	10/21/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/21/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.012**
CLP	10/21/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.024**
CLP	10/21/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**33.8**
CLP	10/21/97	7421	10/22/97	**7439-92-1**	**Lead**	0.001	**0.011**
CLP	10/21/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**21.2**
CLP	10/21/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**8.50**
7470	10/21/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/21/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/21/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.8**
CLP	10/21/97	7740	10/27/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/21/97	7761	10/26/97	**7440-22-4**	**Silver**	0.0002	**0.0002**
CLP	10/21/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**16.1**
CLP	10/21/97	7841	11/03/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/21/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.012**
CLP	10/21/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.017**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01574

JME 11/22/9

254

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 4 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Inorganic Data
SDG No: T924
Site: Willamette River

WORK ASSIGNMENT NO.: 46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABK

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 7 samples, SDG T924, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for inorganics by Analytical Resources, Inc., of Seattle, WA. The samples were numbered:

97384061	97384065	97384077	97384087	97384092
97384102	97384107			

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA OSWER 9240.1-05-01, February 1994).

1. Holding Times

All samples met holding time criteria.

2. Calibration

a. Initial Calibration

Initial calibration frequencies and QC criteria were met.

b. CRI/CRA Standards

Instrument calibration near the project-required detection limit was verified and met recovery criteria for all analytes.

c. Initial and Continuing Calibration Verification

All inductively coupled plasma (ICP) results met control limits of 90 to 110 percent recovery (percent R) of the true values for both initial and continuing calibration.

Mercury cold vapor AA (CVAA) results met control limits of 80 to 120 percent recovery (percent R) for both initial and continuing calibration.

3. Instrument Detection Limits

All instrument detection limits (IDL) for ICP and mercury analyses are equal to or less than the project-required detection limits.

4. Blanks

a. Initial Calibration and Continuing Calibration Blanks

The following elements were found in calibration blanks.

Blank ID	Analyte	Concentration (µg/L)	Associated Samples
CCB7	Thallium	-1	None

No data qualification was required.

b. Field Blanks

No field blank samples were associated with this sample delivery group.

5. ICP Interference Check

All analytes for the interference check samples were within the control limits of 80 to 120 percent of the true values.

6. Laboratory Control Sample

The recoveries for all analytes for both ICP and AA analysis were within the control limits of 80 to 120 percent for water.

7. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 20 percent (or ± detection limit for concentrations < 5 times the detection limit) for water samples.

8. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

9. ICP Serial Dilution

The percent differences (percent D) for ICP serial dilution analysis were within the QC limits of 10 percent for all parameters.

10. Field Duplicate Analysis

No field duplicate samples were associated with this sample delivery group.

11. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 97384061

WR-PW-SD001-0000

Lab Sample ID: T924A
LIMS ID: 97-17686
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**9.01**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.001**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.055**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**10.2**
CLP	10/11/97	6010	10/29/97	**7440-47-3**	**Chromium**	0.005	**0.007**
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.004**
CLP	10/11/97	6010	10/29/97	**7440-50-8**	**Copper**	0.002	**0.006**
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**8.17**
CLP	10/11/97	7421	10/21/97	**7439-92-1**	**Lead**	0.001	**0.004**
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**3.77**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**0.887**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**1.9**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**11.0**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7440-62-2**	**Vanadium**	0.003	**0.018**
CLP	10/11/97	6010	10/29/97	**7440-66-6**	**Zinc**	0.004	**0.025**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET **Sample No: 97384065**
TOTAL METALS

WR-PW-SD011-0000

Lab Sample ID: T924B
LIMS ID: 97-17687
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.51**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.094**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**61.2**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.006**
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**6.49**
CLP	10/11/97	7421	10/21/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**20.0**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**5.94**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**3.4**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**14.7**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/11/97	6010	10/29/97	7440-66-6	Zinc	0.004	0.004 U

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET **Sample No: 9738407**
TOTAL METALS

WR-PW-SD035-0000

Lab Sample ID: T924C
LIMS ID: 97-17688
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.90**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.008**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.124**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**76.9**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.011**
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**26.9**
CLP	10/11/97	7421	10/21/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**24.3**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**8.90**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**4.0**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**15.1**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7440-62-2**	**Vanadium**	0.003	**0.004**
CLP	10/11/97	6010	10/29/97	7440-66-6	Zinc	0.004	0.004 U

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 97384087

WR-PW-SD021-0000

Lab Sample ID: T943A
LIMS ID: 97-17861
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.42**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.004**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.125**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**96.1**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.013**
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**18.5**
CLP	10/11/97	7421	10/21/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**31.8**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**11.7**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**3.9**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**15.0**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/11/97	6010	10/29/97	**7440-66-6**	**Zinc**	0.004	**0.005**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 97384107

WR-PW-SD049-0000

Lab Sample ID: T943B
LIMS ID: 97-17862
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.14**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.139**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**103**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.012**
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**5.53**
CLP	10/11/97	7421	10/21/97	**7439-92-1**	**Lead**	0.001	**0.001**
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**35.2**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**12.9**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**4.7**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**17.6**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/11/97	6010	10/29/97	7440-66-6	Zinc	0.004	0.004 U

U Analyte undetected at given RL

RL Reporting Limit

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JMB 1/21/98

ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 97384102

WR-PW-SD034-0000

Lab Sample ID: T943C
LIMS ID: 97-17863
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.06**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.178**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**163**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	**7440-48-4**	**Cobalt**	0.003	**0.021**
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**21.6**
CLP	10/11/97	7421	10/21/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**55.3**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**20.5**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**5.1**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**17.8**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7440-62-2**	**Vanadium**	0.003	**0.004**
CLP	10/11/97	6010	10/29/97	**7440-66-6**	**Zinc**	0.004	**0.010**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01584

000123 JMB 1/21/98

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: 97384092

WR-PW-SD004-0000

Lab Sample ID: T943D
LIMS ID: 97-17864
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized:
Reported: 10/31/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/11/97	6010	10/29/97	**7429-90-5**	**Aluminum**	0.02	**0.30**
CLP	10/11/97	6010	10/29/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/11/97	7060	10/22/97	7440-38-2	Arsenic	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7440-39-3**	**Barium**	0.001	**0.070**
CLP	10/11/97	6010	10/29/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7440-70-2**	**Calcium**	0.02	**52.2**
CLP	10/11/97	6010	10/29/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/11/97	6010	10/29/97	7440-48-4	Cobalt	0.003	0.003 U
CLP	10/11/97	6010	10/29/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/11/97	6010	10/29/97	**7439-89-6**	**Iron**	0.02	**0.69**
CLP	10/11/97	7421	10/21/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	**7439-95-4**	**Magnesium**	0.02	**18.1**
CLP	10/11/97	6010	10/29/97	**7439-96-5**	**Manganese**	0.001	**4.59**
7470	10/11/97	7470	10/15/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/11/97	6010	10/29/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/11/97	6010	10/29/97	**7440-09-7**	**Potassium**	0.5	**2.9**
CLP	10/11/97	7740	10/23/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/11/97	7761	10/16/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/11/97	6010	10/29/97	**7440-23-5**	**Sodium**	0.05	**16.3**
CLP	10/11/97	7841	10/20/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/11/97	6010	10/29/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/11/97	6010	10/29/97	**7440-66-6**	**Zinc**	0.004	**0.004**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01585

000124 JMB 1/21/9

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 5 February 1998

TO: John Meyer, WAM, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle RMM

SUBJECT: Validation of Inorganic Data
SDG No: T986 and T999
Site: Willamette River

WORK ASSIGNMENT NO.: 46-23-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABI

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle (memo only)

The quality assurance review of 5 samples, SDG T986 and T999, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for inorganics by Analytical Resources, Inc., of Seattle, WA. The samples were numbered:

97394754	97394774	97394773	97384969	97394735

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the U.S. EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA OSWER 9240.1-05-01, February 1994).

1. Holding Times

All samples met holding time criteria.

2. Calibration

a. Initial Calibration

Initial calibration frequencies and QC criteria were met.

b. CRI/CRA Standards

Instrument calibration near the project-required detection limit was verified and met recovery criteria for all analytes.

c. Initial and Continuing Calibration Verification

All inductively coupled plasma (ICP) results met control limits of 90 to 110 percent recovery (percent R) of the true values for both initial and continuing calibration.

Mercury cold vapor AA (CVAA) results met control limits of 80 to 120 percent recovery (percent R) for both initial and continuing calibration.

3. Instrument Detection Limits

All instrument detection limits (IDL) for ICP, and mercury analyses are equal to or less than the project-required detection limits.

4. Blanks

a. Laboratory Method Blanks

The following analytes were detected in laboratory method blanks.

Blank ID	Analyte	Concentration (mg/L)	Associated Samples
97-1192	Aluminum	0.02	97394754, 97394774
	Calcium	0.05	
	Sodium	0.13	

Blank ID	Analyte	Concentration (mg/L)	Associated Samples
97-1193	Calcium	0.05	97394773, 97384969,
	Manganese	0.002	97394735
	Sodium	0.05	

Results for analytes listed above were qualified as undetected (UJ) if concentrations in associated samples were less than five times the concentration present in the blank. No data qualification was required since sample concentrations exceeded the 5 times blank criterion.

b. Initial Calibration and Continuing Calibration Blanks

The following elements were found in calibration blanks.

Blank ID	Analyte	Concentration (µg/L)	Associated Samples
1CCB4	Copper	2.1	None
1CCB14	Thallium	-1.0	None
2ICB	Thallium	-1.1	None
2CCB5	Thallium	-1.1	None

Results for analytes listed above were qualified as undetected (UJ) if concentrations in associated samples were less than five times the concentration present in the blank. No data qualification was required.

c. Field Blanks

No field blank samples were associated with this sample delivery group.

5. ICP Interference Check

All analytes for the interference check samples were within the control limits of 80 to 120 percent of the true values.

6. Laboratory Control Sample

The recoveries for all analytes for both ICP and AA analysis were within the control limits of 80 to 120 percent for water.

7. Laboratory Duplicate Sample Analysis

All relative percent differences (RPD) between analytical results were within the QC limit of 20 percent (or ± detection limit for concentrations < 5 times the detection limit) for water samples.

8. Spiked Sample Analysis

Matrix spike recoveries for all analytes met QC criteria of 75 to 125 percent.

9. ICP Serial Dilution

The percent differences (percent D) for ICP serial dilution analysis were within the QC limits of 10 percent for all parameters.

10. Field Duplicate Analysis

Samples 97394773 and 97394774 were field duplicates. Results exhibited reasonable agreement, with the exception of iron (RPD = 69.64%). No data were qualified since field duplicate samples reflect field variability rather than laboratory precision.

11. Laboratory Contact

No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The material was analyzed for, but was not detected.

UJ - The analyte was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported were less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET **Sample No: 9739 4754**
TOTAL METALS

WR-PW-SD133-0000

Lab Sample ID: T986B
LIMS ID: 97-18187
Matrix: Pore Water

QC Report No: T986-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 09/30/97

Data Release Authorized:
Reported: 11/14/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/22/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**6.47**
CLP	10/22/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/22/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.004**
CLP	10/22/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.093**
CLP	10/22/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**43.2**
CLP	10/22/97	6010	11/06/97	**7440-47-3**	**Chromium**	0.005	**0.006**
CLP	10/22/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.006**
CLP	10/22/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.045**
CLP	10/22/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**13.0**
CLP	10/22/97	7421	10/24/97	**7439-92-1**	**Lead**	0.001	**0.011**
CLP	10/22/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**17.7**
CLP	10/22/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**4.07**
7470	10/22/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/22/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/22/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.1**
CLP	10/22/97	7740	10/29/97	7782-49-2	Selenium	0.002	0.002 U
CLP	10/22/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/22/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**18.8**
CLP	10/22/97	7841	10/28/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.017**
CLP	10/22/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.073**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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ANALYTICAL
RESOURCES
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INORGANICS ANALYSIS DATA SHEET **Sample No: 9739 4774**
TOTAL METALS

WR-PW-SD146-1000

Lab Sample ID: T986C
LIMS ID: 97-18188
Matrix: Pore Water

QC Report No: T986-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 09/30/97

Data Release Authorized:
Reported: 11/14/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/22/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.69**
CLP	10/22/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/22/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.003**
CLP	10/22/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.139**
CLP	10/22/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**136**
CLP	10/22/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/22/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.019**
CLP	10/22/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**24.2**
CLP	10/22/97	7421	10/24/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**46.6**
CLP	10/22/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**13.5**
7470	10/22/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/22/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/22/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.6**
CLP	10/22/97	7740	10/29/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/22/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/22/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.8**
CLP	10/22/97	7841	10/30/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.004**
CLP	10/22/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.009**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET **Sample No: 97394773**
TOTAL METALS

WR-PW-SD146-0000

Lab Sample ID: T999A
LIMS ID: 97-18246
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized:
Reported: 11/14/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/22/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.07**
CLP	10/22/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/22/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.002**
CLP	10/22/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.128**
CLP	10/22/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**121**
CLP	10/22/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/22/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.015**
CLP	10/22/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**11.7**
CLP	10/22/97	7421	10/24/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**42.0**
CLP	10/22/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**11.7**
7470	10/22/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/22/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/22/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.5**
CLP	10/22/97	7740	10/29/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/22/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/22/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.7**
CLP	10/22/97	7841	10/28/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.003**
CLP	10/22/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.006**

U Analyte undetected at given RL

RL Reporting Limit

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET **Sample No: 97384969**
TOTAL METALS

WR-PW-SD102-0000

Lab Sample ID: T999B
LIMS ID: 97-18247
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized:
Reported: 11/14/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/22/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**0.11**
CLP	10/22/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/22/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.003**
CLP	10/22/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.085**
CLP	10/22/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**71.2**
CLP	10/22/97	6010	11/06/97	7440-47-3	Chromium	0.005	0.005 U
CLP	10/22/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.012**
CLP	10/22/97	6010	11/06/97	7440-50-8	Copper	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**12.1**
CLP	10/22/97	7421	10/24/97	7439-92-1	Lead	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**24.1**
CLP	10/22/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**7.68**
7470	10/22/97	7470	10/22/97	7439-97-6	Mercury	0.0001	0.0001 U
CLP	10/22/97	6010	11/06/97	7440-02-0	Nickel	0.01	0.01 U
CLP	10/22/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**3.6**
CLP	10/22/97	7740	10/29/97	7782-49-2	Selenium	0.001	0.001 U
CLP	10/22/97	7761	10/26/97	7440-22-4	Silver	0.0002	0.0002 U
CLP	10/22/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**11.5**
CLP	10/22/97	7841	10/28/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-62-2	Vanadium	0.003	0.003 U
CLP	10/22/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.006**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

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ANALYTICAL
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INORGANICS ANALYSIS DATA SHEET **Sample No: 97394735**
TOTAL METALS

WR-PW-SD128-0000

Lab Sample ID: T999C
LIMS ID: 97-18248
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized:
Reported: 11/14/97

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L
CLP	10/22/97	6010	11/06/97	**7429-90-5**	**Aluminum**	0.02	**19.4**
CLP	10/22/97	6010	11/06/97	7440-36-0	Antimony	0.05	0.05 U
CLP	10/22/97	7060	10/28/97	**7440-38-2**	**Arsenic**	0.001	**0.007**
CLP	10/22/97	6010	11/06/97	**7440-39-3**	**Barium**	0.001	**0.111**
CLP	10/22/97	6010	11/06/97	7440-41-7	Beryllium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	7440-43-9	Cadmium	0.002	0.002 U
CLP	10/22/97	6010	11/06/97	**7440-70-2**	**Calcium**	0.02	**31.6**
CLP	10/22/97	6010	11/06/97	**7440-47-3**	**Chromium**	0.005	**0.020**
CLP	10/22/97	6010	11/06/97	**7440-48-4**	**Cobalt**	0.003	**0.008**
CLP	10/22/97	6010	11/06/97	**7440-50-8**	**Copper**	0.002	**0.134**
CLP	10/22/97	6010	11/06/97	**7439-89-6**	**Iron**	0.02	**23.3**
CLP	10/22/97	7421	10/24/97	**7439-92-1**	**Lead**	0.002	**0.047**
CLP	10/22/97	6010	11/06/97	**7439-95-4**	**Magnesium**	0.02	**15.0**
CLP	10/22/97	6010	11/06/97	**7439-96-5**	**Manganese**	0.001	**2.78**
7470	10/22/97	7470	10/22/97	**7439-97-6**	**Mercury**	0.0001	**0.0001**
CLP	10/22/97	6010	11/06/97	**7440-02-0**	**Nickel**	0.01	**0.02**
CLP	10/22/97	6010	11/06/97	**7440-09-7**	**Potassium**	0.5	**2.9**
CLP	10/22/97	7740	10/29/97	7782-49-2	Selenium	0.002	0.002 U
CLP	10/22/97	7761	10/26/97	**7440-22-4**	**Silver**	0.0002	**0.0003**
CLP	10/22/97	6010	11/06/97	**7440-23-5**	**Sodium**	0.05	**14.0**
CLP	10/22/97	7841	10/28/97	7440-28-0	Thallium	0.001	0.001 U
CLP	10/22/97	6010	11/06/97	**7440-62-2**	**Vanadium**	0.003	**0.036**
CLP	10/22/97	6010	11/06/97	**7440-66-6**	**Zinc**	0.004	**0.179**

U Analyte undetected at given RL

RL Reporting Limit

FORM-I

01595

JMB 1/21/98

185

Roy F. Weston, Inc.
Suite 5700
700 5th Avenue
Seattle, Washington 98104-5057
206-521-7600 • Fax 206-521-7601

MEMORANDUM

DATE: 3 February 1998

TO: John Meyer, Site Manager, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Organotin Data
SDG No: T976
Site: Willamette River

WORK ASSIGNMENT NO: 46-35-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABB

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle

The quality assurance review of 18 samples, SDG T976, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for organotins by Analytical Resources, Inc. (ARI) of Seattle, Washington. The samples were numbered:

97384932	97394769	97384949	97384962
97394721	97384959	97394717	97394740
97394737	97394757	97384900	97384902
97384923	97384914	97384931	97384942
97384920	97384936		

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1, February 1994), modified to include specific requirements of analytical methods.

1. Timeliness

All samples met holding time criteria.

2. GC/MS Instrument Performance Check

All tuning check compound mass abundances and ratios were within required limits.

3. Initial Calibration

All target analytes and system monitoring compounds were within required limits for the initial calibration.

4. Continuing Calibrations

All target analytes were within required limits for the continuing calibration with $\overline{RRF}$ percent differences less than 25 percent except:

Date	Time	Compound	% Diff	Associated Samples
11/3/97	14:49	Tributyltin	-35.6	97384920, 97384936

Positive results for compounds associated with the above calibrations and samples have been qualified as estimated (J).

5. Detection Limits—Acceptable

Instrument detection limits met project required quantitation limits.

6. Blanks

a. Laboratory Method Blanks

Laboratory method blank frequency criteria were met.

No target analytes were reported in laboratory method blanks.

b. Field Blanks

No field blanks were associated with this SDG.

7. System Monitoring Compounds (Surrogates)

Surrogate compound percent recovery met quality control criteria for all samples, with the exception of the following:

Sample	Surrogate	Percent Recovery	QC Limit
97384962	Tripropyltin	14.4	31-100%

Sample results were qualified as estimated (J).

8. Laboratory Control Sample (LCS)

All laboratory control sample percent recoveries met QC guidelines, with the exception of the following:

LCS	Analyte	Percent Recovery	QC Limit	Associated Samples
LCS 10/3/97	Butyltin	6.4	10-120	97384900, 97384902,
	Butyltin	8.0	10-120	97384914, 97384920, 97384923, 97384931, 97384932, 97384936, 97384942, 97384949, 97384959, 97384962, 97394717, 97394721, 97394737, 97394740, 97394757, 97394769

Detected sample results were qualified as estimated (J). Reported quantitation limits were qualified as rejected (R).

9. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

   All MS/MSD sample percent recoveries and relative percent differences (RPDs) met QC guidelines.

10. Internal Standards Performance

    Internal standard areas were within requirements of -50 percent to +100 percent of associated calibration internal standard areas. Retention time shifts for internal standards met requirements of less than 30 seconds.

11. Field Duplicate Analysis

    Samples 97384931 and 97384932 were the field duplicates. Relative percent differences (RPDs) showed acceptable agreement.

12. Sample Analysis

    No unusual problems were noted. Sample results are reported as the organotin chloride.

13. Laboratory Contact

    No laboratory contract was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the quantitation limit or lowest calibration standard.

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R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

N - Presumptive evidence of presence of material (tentative identification).

 JRM

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Sample No: 9738 4932
WR-PW-SD074-1000

Lab Sample ID: T976A
LIMS ID: 97-18134
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 J/R

TBT Surrogate Recovery

Tripropyl Tin	51.6%
Tripentyl Tin	70.2%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 ~~9738~~ 4769 WR-PW-SD143-0000

Lab Sample ID: T976B
LIMS ID: 97-18135
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 UR

TBT Surrogate Recovery

Tripropyl Tin	60.2%
Tripentyl Tin	74.2%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4949
WR-BW-SD077-0000

Lab Sample ID: T976C
LIMS ID: 97-18136
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	37.6%
Tripentyl Tin	55.6%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4962
WR-PW-SD096-0000

Lab Sample ID: T976D
LIMS ID: 97-18137
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 UJ
Tributyl Tin	0.02 UJ
Dibutyl Tin	0.06 U
Butyl Tin	0.06 UR

TBT Surrogate Recovery

Tripropyl Tin	14.4%
Tripentyl Tin	46.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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	Sample No:	**9738 4962 REEXTRACT** WR-PW-SD096-0000
Lab Sample ID: T976D-RE	QC Report No:	T976-REGL, LLC
LIMS ID: 97-18137	Project:	1001-006
Matrix: Pore Water		
	Date Sampled:	09/27/97
	Date Received:	09/29/97

Data Release Authorized: CMW
Reported: 12/01/97

Date extracted: 11/11/97	Sample Amount: 400 mL
Date analyzed: 11/28/97	Final Extract Volume: 0.5 mL
Instrument: FINN2	Dilution Factor: 1:1
Alumina: YES	

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	55.4%
Tripentyl Tin	77.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector.
D	Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 4721 WR-PW-SD116-0000

Lab Sample ID: T976E
LIMS ID: 97-18138
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized: mw
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 NR

TBT Surrogate Recovery

Tripropyl Tin	57.0%
Tripentyl Tin	102%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4959 WR-PW-SD089-0000

Lab Sample ID: T976F
LIMS ID: 97-18139
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/27/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	57.4%
Tripentyl Tin	83.0%

Data Qualifiers

- U Indicates compound was analyzed for, but not detected at the given detection limit.
- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector. Dilution Required
- B Found in associated method blank.
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.

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Sample No: 9739 4717 WR-PW-SD106-0000

Lab Sample ID: T976G
LIMS ID: 97-18140
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	46.6%
Tripentyl Tin	72.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 4740
WR-PW-SD130-0000

Lab Sample ID: T976H
LIMS ID: 97-18141
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized:
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.07**
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	52.4%
Tripentyl Tin	68.0%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 4737 WR-PW-SD125-0000

Lab Sample ID: T976I
LIMS ID: 97-18142
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized: mw
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 NR

TBT Surrogate Recovery

Tripropyl Tin	47.4%
Tripentyl Tin	72.4%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 4757
WR-PW-SD020-0000

Lab Sample ID: T976J
LIMS ID: 97-18143
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/28/97
Date Received: 09/29/97

Data Release Authorized: MV
Reported: 12/01/97

[redacted] Dilution Factor: 1.1

Alumina: YES

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 UR

TBT Surrogate Recovery

Tripropyl Tin	54.2%
Tripentyl Tin	57.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4900 WR-PW-SD053-0000

Lab Sample ID: T976K
LIMS ID: 97-18144
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 ~~U~~ R

TBT Surrogate Recovery

Tripropyl Tin	59.8%
Tripentyl Tin	74.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4902
WR-SD-SD056-0000

Lab Sample ID: T976L
LIMS ID: 97-18145
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 NR

TBT Surrogate Recovery

Tripropyl Tin	47.2%
Tripentyl Tin	74.4%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4923 WR-PW-SD058-0000

Lab Sample ID: T976M
LIMS ID: 97-18146
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.03**
Dibutyl Tin	0.06 U
Butyl Tin	0.06 UR

TBT Surrogate Recovery

Tripropyl Tin	61.4%
Tripentyl Tin	77.0%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4914 WR-PW-SD048-0000

Lab Sample ID: T976N
LIMS ID: 97-18147
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MM
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	57.4%
Tripentyl Tin	100%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4931
WR-PW-SD074-0000

Lab Sample ID: T9760
LIMS ID: 97-18148
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	51.6%
Tripentyl Tin	77.8%

Data Qualifiers

- U — Indicates compound was analyzed for, but not detected at the given detection limit.
- J — Indicates an estimated value when that result is less than the calculated detection limit.
- E — Indicates a value above the linear range of the detector. Dilution Required
- B — Found in associated method blank.
- NA — Indicates compound was not analyzed.
- NR — Indicates no recovery due to interferences.

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Sample No: 9738 4942
WR-PW-SD070-0000

Lab Sample ID: T976P
LIMS ID: 97-18149
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: TMW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/01/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 JR

TBT Surrogate Recovery

Tripropyl Tin	50.0%
Tripentyl Tin	78.4%

Data Qualifiers

- U Indicates compound was analyzed for, but not detected at the given detection limit.
- J Indicates an estimated value when that result is less than the calculated detection limit.
- E Indicates a value above the linear range of the detector. Dilution Required
- B Found in associated method blank.
- NA Indicates compound was not analyzed.
- NR Indicates no recovery due to interferences.

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Sample No: 9738 4920
WR-PW-SD057-0000

Lab Sample ID: T976Q
LIMS ID: 97-18150
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U J
Dibutyl Tin	0.06 U
Butyl Tin	0.06 J R

TBT Surrogate Recovery

Tripropyl Tin	39.0%
Tripentyl Tin	49.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738 4936
WR-PW-SD064-0000

Lab Sample ID: T976R
LIMS ID: 97-18151
Matrix: Pore Water

QC Report No: T976-REGL, LLC
Project: 1001-006

Date Sampled: 09/26/97
Date Received: 09/29/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.18** J
Dibutyl Tin	0.06 U
Butyl Tin	0.06 UR

TBT Surrogate Recovery

Tripropyl Tin	56.2%
Tripentyl Tin	103%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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MEMORANDUM

DATE: 4 February 1998

TO: John Meyer, Site Manager, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Organotin Data
SDG No: T924
Site: Willamette River

WORK ASSIGNMENT NO: 46-35-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABJ

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle

The quality assurance review of 7 samples, SDG T924, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for organotins by Analytical Resources, Inc. (ARI) of Seattle, Washington. The samples were numbered:

97384061	97384065	97384077	97380487
97384092	97384102	97384107	

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1, February 1994), modified to include specific requirements of analytical methods.

98-0074a.dvm
DCN 4000-019-036-AABJ

1. Timeliness

   All samples met holding time criteria.

2. Detection Limits—Acceptable

   Instrument detection limits met project required quantitation limits.

3. GC/MS Instrument Performance Check

   All tuning check compound mass abundances and ratios were within required limits.

4. Initial Calibration

   All target analytes and system monitoring compounds were within required limits for the initial calibration.

5. Continuing Calibrations

   All target analytes were within required limits for the continuing calibrations.

6. Blanks

   a. Laboratory Method Blanks

      Laboratory method blank frequency criteria were met.

      No target analytes were reported in laboratory method blanks.

   b. Field Blanks

      No field blanks were associated with this SDG.

7. System Monitoring Compounds (Surrogates)

   Surrogate compound percent recovery met quality control criteria for all samples.

8. Laboratory Control Sample (LCS)

   All laboratory control sample percent recoveries met QC guidelines.

9. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

   All MS/MSD sample percent recoveries and relative percent differences (RPDs) met QC guidelines.

10. Internal Standards Performance

    Internal standard areas were within requirements of -50 percent to +100 percent of associated calibration internal standard areas. Retention time shifts for internal standards met requirements of less than 30 seconds.

11. Field Duplicate Analysis

    No field duplicate samples were associated with this sample delivery group.

12. Sample Analysis

    No unusual problems were noted. Sample results are reported as the butyltin chloride species.

13. Laboratory Contact

    No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

N - Presumptive evidence of presence of material (tentative identification).

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Sample No: 97384061
WR-PW-SD001-0000

Lab Sample ID: T924A
LIMS ID: 97-17686
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized: MW
Reported: 11/25/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.03**
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	52.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Tributyl Tins by Selected Ion Monitoring GC/MS
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Sample No: 97384065 WR-PW-SD011-0000

Lab Sample ID: T924B
LIMS ID: 97-17687
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized: MW
Reported: 11/25/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	74.4%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9738407 WR-PW-SD035-0000

Lab Sample ID: T924C
LIMS ID: 97-17688
Matrix: Pore Water

QC Report No: T924-Roy F. Weston
Project:

Date Sampled: 09/23/97
Date Received: 09/24/97

Data Release Authorized: WWW
Reported: 11/25/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	53.0%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97384087
WR-PW-SD021-0000

Lab Sample ID: T943A
LIMS ID: 97-17861
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized: [signature]
Reported: 11/26/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	63.0%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97384107
WR-PW-SD049-0000

Lab Sample ID: T943B
LIMS ID: 97-17862
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized: MW
Reported: 11/26/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	40.2%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97384102
WR-PW-SD034-0000

Lab Sample ID: T943C
LIMS ID: 97-17863
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized: YMM
Reported: 11/26/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.03**
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	63.6%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97384092
WR-PW-SD004-0000

Lab Sample ID: T943D
LIMS ID: 97-17864
Matrix: Pore Water

QC Report No: T943-REGL, LLC
Project:

Date Sampled: 09/24/97
Date Received: 09/25/97

Data Release Authorized: MN
Reported: 11/26/97

Date extracted: 09/29/97
Date analyzed: 10/31/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	53.2%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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MEMORANDUM

DATE: 4 February 1998

TO: John Meyer, Site Manager, U.S. EPA, Region X

FROM: Jennifer M. Baier, Environmental Chemist, WESTON, Seattle JMB
RMM Roger McGinnis, Senior Environmental Chemist, WESTON, Seattle

SUBJECT: Validation of Organotin Data
SDG No: T986 and T999
Site: Willamette River

WORK ASSIGNMENT NO: 46-35-0JZZ

DOC. CONTROL NO.: 4000-019-036-AABH

WORK ORDER NO.: 4000-019-036-5200-00

cc: Bruce Woods, RAP-WAM, U.S. EPA, Region X
Karen Stash, Project Manager, WESTON, Seattle

The quality assurance review of 5 samples, SDG T986 and T999, collected from the Willamette River has been completed. The porewater samples were analyzed at low level for organotins by Analytical Resources, Inc. (ARI) of Seattle, Washington. The samples were numbered:

97394754	97394774	97394773	97384969	97394735

Data Qualifications

The following comments refer to the laboratory performance in meeting the quality control criteria described in the technical specifications of the laboratory subcontract. The review follows the format described in the *National Functional Guidelines for Organic Data Review* (EPA OSWER Directive 9240.1, February 1994), modified to include specific requirements of analytical methods.

1. Timeliness

   All samples met holding time criteria.

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2. GC/MS Instrument Performance Check

All tuning check compound mass abundances and ratios were within required limits.

3. Initial Calibration

All target analytes and system monitoring compounds were within required limits for the initial calibration.

4. Continuing Calibration

All target analytes were within required limits for the continuing calibration with RRF percent differences less than 25 percent except:

Date	Time	Compound	% Diff	Associated Samples
11/3/97	14:49	Tributyltin	-35.6	97394754, 97394774, 97394773, 97384969, 97394735

Positive results for compounds associated with the above calibrations and samples have been qualified as estimated (J).

5. Detection Limits—Acceptable

Instrument detection limits met project required quantitation limits.

6. Blanks

a. Laboratory Method Blanks

Laboratory method blank frequency criteria were met.

No target analytes were reported in laboratory method blanks.

b. Field Blanks

No field blanks were associated with this SDG.

JRM

7. System Monitoring Compounds (Surrogates)

   Surrogate compound percent recovery met quality control criteria for all samples.

8. Laboratory Control Sample (LCS)

   All laboratory control sample percent recoveries met QC guidelines.

9. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

   All MS/MSD sample percent recoveries and relative percent differences (RPDs) met QC guidelines.

10. Internal Standards Performance

    Internal standard areas were within requirements of -50 percent to +100 percent of associated calibration internal standard areas. Retention time shifts for internal standards met requirements of less than 30 seconds.

11. Field Duplicate Analysis

    Samples 97394773 and 97394774 were the field duplicates. Relative percent differences (RPDs) showed acceptable agreement.

12. Sample Analysis

    No unusual problems were noted. Sample results are reported as the butyltin chloride species.

13. Laboratory Contact

    No laboratory contact was required.

Data Assessment

Upon consideration of the data qualifications noted above, the data are ACCEPTABLE for use except where flagged with data qualifiers that modify the usefulness of the individual values.

Data Qualifiers

U - The compound was analyzed for, but was not detected.

UJ - The compound was analyzed for, but was not detected. The associated quantitation limit is an estimate because quality control criteria were not met.

J - The analyte was positively identified, but the associated numerical value is an estimated quantity because quality control criteria were not met or because concentrations reported are less than the quantitation limit or lowest calibration standard.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis are necessary for verification.

N - Presumptive evidence of presence of material (tentative identification).

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Sample No: 9739 4754 WR-~~PB~~-PW-SD133-0000

Lab Sample ID: T986B
LIMS ID: 97-18187
Matrix: Pore Water

QC Report No: T986-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 09/30/97

Data Release Authorized: WW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.42** J
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	42.8%
Tripentyl Tin	73.4%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 9739 4774
WR-PW-SD146-1000

Lab Sample ID: T986C
LIMS ID: 97-18188
Matrix: Pore Water

QC Report No: T986-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 09/30/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U J
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	35.4%
Tripentyl Tin	66.6%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97394773
WR-PW-SD146-0000

Lab Sample ID: T999A
LIMS ID: 97-18246
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 UJ
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	46.8%
Tripentyl Tin	107%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97384969 WR-PW-SD102-0000

Lab Sample ID: T999B
LIMS ID: 97-18247
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	0.02 U J
Dibutyl Tin	0.06 U
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	39.2%
Tripentyl Tin	67.4%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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Sample No: 97394735 WR-PW-SD128-0002

Lab Sample ID: T999C
LIMS ID: 97-18248
Matrix: Porewater

QC Report No: T999-REGL, LLC
Project: 1001-006

Date Sampled: 09/30/97
Date Received: 10/01/97

Data Release Authorized: MW
Reported: 12/01/97

Date extracted: 10/03/97
Date analyzed: 11/03/97
Instrument: FINN2
Alumina: YES

Sample Amount: 400 mL
Final Extract Volume: 0.5 mL
Dilution Factor: 1:1

Analyte	ug/L
Tetrabutyl Tin	0.02 U
Tributyl Tin	**0.50** J
Dibutyl Tin	**0.10**
Butyl Tin	0.06 U

TBT Surrogate Recovery

Tripropyl Tin	37.4%
Tripentyl Tin	69.8%

Data Qualifiers

U	Indicates compound was analyzed for, but not detected at the given detection limit.
J	Indicates an estimated value when that result is less than the calculated detection limit.
E	Indicates a value above the linear range of the detector. Dilution Required
B	Found in associated method blank.
NA	Indicates compound was not analyzed.
NR	Indicates no recovery due to interferences.

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